

AMENDMENTS TO THE CLAIMS

Please amend claims as shown below. A complete listing of the claims, including their current status, is set forth below.

1-11. **(Cancelled)**

12. **(Previously presented)** A method for producing an insulin-producing cell *in vitro*, the method comprising:

introducing a nucleic acid molecule operably linked to a promoter into a cell *in vitro*, the nucleic acid molecule encoding a neuroendocrine class B basic helix-loop-helix (bHLH) transcription factor, said introducing being in an amount sufficient for production of the neuroendocrine bHLH transcription factor and production of an insulin-producing cell;

wherein said cell is a cultured gastrointestinal organ cell.

13. **(Previously presented)** The method of claim 12, wherein the neuroendocrine bHLH transcription factor is neurogenin3.

14. **(Withdrawn)** The method of claim 12, wherein the neuroendocrine bHLH transcription factor is a positive regulator of a neurogenin3 (Ngn3) regulatory pathway.

15. **(Cancelled)**

16. **(Withdrawn)** The method of claim 12, wherein the neuroendocrine bHLH transcription factor is neurogenin1, neurogenin2, NeuroD1/BETA2, neuroD2, math2, NeuroD4/Math3, math1/ATOH1, mash1/ASCL1/ASH1 or mash2.

17. **(Cancelled)**

18. **(Previously presented)** The method of claim 12, wherein the insulin-producing cell produced is an insulin-producing islet cell.

19. **(Previously presented)** A method for producing a mammalian insulin-producing cell *in vitro*, the method comprising the steps of:

introducing into a mammalian cell *in vitro* a nucleic acid molecule operably linked to a promoter, the nucleic acid molecule encoding a neuroendocrine class B bHLH transcription factor, wherein said introducing provides for expression of the transcription factor in the mammalian cell and production of insulin in the mammalian cell;

wherein said mammalian cell is a cultured gastrointestinal organ cell.

20. **(Original)** The method of claim 19, wherein the mammalian cell is a pancreatic cell.

21. **(Previously presented)** The method of claim 19, wherein the neuroendocrine bHLH transcription factor is neurogenin3.

22. **(Withdrawn)** The method of claim 19, wherein the neuroendocrine bHLH transcription factor is a positive regulator of a neurogenin3 (Ngn3) regulatory pathway.

23. **(Withdrawn)** The method of claim 19, wherein the neuroendocrine bHLH transcription factor is neurogenin1, neurogenin2, NeuroD1/BETA2, neuroD2, math2, NeuroD4/Math3, math1/ATOH1, mash1/ASCL1/ASH1 or mash2.

24. **(Cancelled)**

25. **(Previously presented)** A method for producing a mammalian insulin-producing cell *in vitro*, the method comprising the steps of:

introducing into a mammalian pancreatic cell *in vitro* a nucleic acid molecule the nucleic acid molecule being operably linked to a promoter, said nucleic acid molecule encoding neurogenin3 (Ngn3), wherein said introducing provides for expression of Ngn3 in the cell and production of insulin in the cell.

26. **(Cancelled)**

27. **(Previously presented)** A method for delivering insulin to the bloodstream of a mammalian subject, the method comprising:

introducing an insulin-producing cell produced by the method of claim 25 into a mammalian subject, wherein said introducing provides for production of insulin by the insulin-producing cell and delivery of insulin to the bloodstream of the mammalian subject.

28. **(Previously presented)** A method for delivering insulin to the bloodstream of a mammalian subject, the method comprising:

introducing an insulin-producing cell produced by the method of claim 12 into a mammalian subject, wherein said introducing provides for production of insulin by the insulin-producing cell and delivery of insulin to the bloodstream of the mammalian subject.

29. **(Previously presented)** A method for delivering insulin to the bloodstream of a mammalian subject, the method comprising:

introducing an insulin-producing cell produced by the method of claim 19 into a pancreas of a mammalian subject, wherein said introducing provides for production of insulin by the insulin-producing cell and delivery of insulin to the bloodstream of the mammalian subject.

30. **(Currently amended)** The method of claim 12, where the precursor cultured gastrointestinal organ cell is an a cultured adult pancreatic cell.

31-36. **(Cancelled).**

37. **(Previously presented)** The method of claim 12, wherein said cultured gastrointestinal organ cell is pancreas cell.

38. **(Previously presented)** The method of claim 19, wherein said cultured gastrointestinal organ cell is pancreas cell.

39. **(Previously presented)** The method of claim 12, wherein said cultured gastrointestinal organ cell is a liver cell.

40. **(Previously presented)** The method of claim 19, wherein said cultured gastrointestinal organ cell is a liver cell.

41. **(Previously presented)** A method for producing insulin *in vitro*, comprising:
culturing a gastrointestinal organ cell *in vitro* to produce insulin, wherein said cell comprises a recombinant nucleic acid molecule comprising a nucleic acid molecule encoding a neuroendocrine class B basic helix-loop-helix (bHLH) transcription factor operably linked to a promoter.

42. **(Withdrawn)** The method of claim 41, wherein the neuroendocrine bHLH transcription factor is neurogenin1, neurogenin2, NeuroD1/BETA2, neuroD2, math2, NeuroD4/Math3, math1/ATOH1, mash1/ASCL1/ASH1 or mash2.

43. **(Previously presented)** The method of claim 41, wherein said gastrointestinal organ cell is a pancreatic or liver cell.

44. **(Previously presented)** The method of claim 41, wherein said gastrointestinal organ cell is a gut or salivary gland cell.

45. **(Currently amended)** The method of claim 12 ~~claim 1~~, wherein said cultured gastrointestinal organ cell is a cultured gut or salivary gland cell.